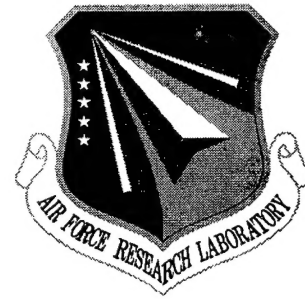


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EXPLORING A THEORY DESCRIBING THE PHYSICS OF INFORMATION SYSTEMS, INFORMATION PHYSICS BIBLIOGRAPHY

Zetetix

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APPROVED:



DEBORAH A. CERINO
Project Engineer

FOR THE DIRECTOR:



JAMES A. COLLINS, Acting Chief
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Scott Young Harmon

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Principal Investigator: Scott Young Harmon

Phone: (818) 991-0480

AFRL Project Engineer: Deborah A. Cerino

Phone: (315) 330-1445

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13. ABSTRACT (Maximum 200 words) This project accomplished all of its objectives: document a theory of information physics, conduct a workshop on planning experiments to test this theory, and design experiments that validate this theory. Information physics proposes quantitative relationships between observable information flows and changes in the content information systems maintain. This theory explains all flows within information systems as either diffusive or force-driven. The forces driving information flows arise from the existence of goal content. The workshop participants discussed various theories and considered experiments that characterize the macroscopic phenomena underlying complex information system behavior. These participants identified experimental opportunities that exploit existing databases, execute simulations and conduct traditional controlled experiments. They recommended that focussed experiments to test theories explaining information system phenomena were feasible today. The experiment plan builds upon the workshop's result and proposes experiments that measure information device energy dissipation, test the independence of symbol execution work from device efficiency, measure information diffusion rates in information systems, and measure force-driven information flows. These experiments are both technically and programmatically feasible. When validated, the proposed theory can guide designers to reliably build more effective, secure and predictable information systems.				
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The bibliography presented below was collected to explore the prior work related to information physics. This bibliography includes references from the fields of complexity theory, the theory of computation, computational complexity, the physics of computation, thermodynamics, information theory, reversible computation, and quantum computation among others. Regrettably, the coverage of these fields is largely incomplete, especially in the areas of complexity theory, information theory and quantum computation, all of which contain vast bodies of knowledge in themselves. However, the purpose of this bibliography was not to provide complete coverage of all possible sources of information but more to collect possible pointers into the fields that contain knowledge relevant to information physics. Particular effort was spent in collecting the references related to the physics of computation so any bias resides in that direction.

As with all bibliographies of dynamic fields of study, this one represents a snapshot of the field as of October 2000. Many of the entries contained herein are incomplete, some more than others. The contents of this bibliography reside in a bibliographic database and will be updated as periodically as possible. The author invites comments, corrections and additions to this bibliography and may be contacted through the information presented on the cover page.

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